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C20-C-CM-103**7018****BOARD DIPLOMA EXAMINATION, (C-20)****SEPTEMBER/OCTOBER—2021****DCE - FIRST YEAR EXAMINATION****ENGINEERING PHYSICS***Time : 3 hours]**[Total Marks : 80***PART—A**

3×10=30

- Instructions :**
- (1) Answer **all** questions.
 - (2) Each question carries **three** marks.
 - (3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the terms (a) unit, (b) dimension and (c) error in measurement.
2. Define scalar and vector. Give one example each.
3. Define oblique projection and give two examples.
4. State any three laws of friction.
5. Define kinetic energy. Write its SI units and give example.
6. Define simple harmonic motion and give two examples.
7. An amount of heat energy supplied to the system is 600 J so that its internal energy increased by 100 J. Find the work done by the system.
8. Find the minimum distance between source and obstacle to hear an echo, if velocity of sound in air is 340 ms^{-1} and persistence of hearing is 0.1 second.

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9. Define specific resistance and write its SI units.
10. Define magnetic induction field strength. Write its formula and SI unit.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) State the parallelogram law of vectors. Obtain the expression for magnitude and direction of the resultant vector.

OR

- (b) Derive an expression for time of flight and horizontal range of projectile in the case of oblique projection.

12. (a) A body placed at the top of 10 m long plane surface inclined at an angle 30° with the horizontal slides down. If $\mu = 0.18$ find the
- (i) acceleration of the body;
 - (ii) velocity at the bottom of the plane;
 - (iii) time taken by it to reach the bottom.

OR

- (b) State the law of conservation of energy and verify it in the case of freely falling body.

13. (a) Derive an expression for velocity and acceleration of a particle executing simple harmonic motion.

OR

- (b) Derive ideal gas equation for 'n' moles of gas and find the value of universal gas constant 'R'.

14. (a) Mention any four methods to minimize the noise pollution and write any four applications of Doppler effect.

OR

- (b) State Hooke's law in elasticity, and obtain the Newton's formula for viscous force and hence define coefficient of viscosity.
15. (a) Derive an expression for balancing condition of Wheatstone bridge with neat circuit diagram, and a bar magnet of pole strength 60 A.m. has a length 0.2 m. Find the magnetic moment.

OR

- (b) State the laws of photoelectric effect and write any three applications of optical fibers.

PART—C

10×1=10

Instruction : (1) Answer the following question that carries **ten** marks.

16. Derive an expression for time period of simple pendulum. A pendulum clock gives correct time at the equator. Will it gain or loose time as it is taken to poles?

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